

Appl. No. 10/528,083
Amdt. dated September 19, 2007
Reply to Office Action of May 21, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claims 1-5 as follows:

1. (currently amended) A fuel injection nozzle for DME fuel, which is mounted in each combustion chamber of a light oil fuel diesel engine and is for driving the light oil fuel diesel engine by using DME fuel, comprising:

a nozzle body having a fuel injection hole with a total injection hole area to attain an injection amount of the DME fuel which enables an engine output comparable to light oil fuel to be obtained; and a needle valve provided to be capable of reciprocating to the fuel injection hole and having a tip part of a substantially right circular cone shape, characterized in that

the needle valve is configured to form a valve closed state as the tip part is seated on a valve seat part of the nozzle body at a position before the fuel injection hole, and to form a valve open state as the tip part is lifted to be separated from the valve seat part , and the needle valve is lifted from a state where a tip part of the needle valve is seated on a valve seat part of the fuel injection hole and from a state where the fuel injection hold is closed, and the tip part of the needle valve is separated from the valve seat the valve closed state to shift into the valve open state, so that a fuel flow path of the DME fuel from an inside of the nozzle body to the fuel injection hole is ~~constructed~~ defined, and

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the tip part of a substantially right circular cone shape, of the needle valve has a shape set by a center diameter for defining a minimum flow path area of the fuel flow path defined as a minimum interval between the needle valve at full lift and the valve seat part, a seat diameter of a seat part which is positioned on a root side with respect to the center diameter and is for coming in contact with the valve seat part and blocking communication with the fuel injection hole, and a shaft diameter of a needle valve body, and

the tip part of the needle valve is shaped such that a size of the center diameter is made closer to that of the seat diameter by positioning the center diameter closer to the seat diameter, to such a degree that an injection amount of the DME fuel which enables the fuel flow path with a flow path area to enable an engine output characteristic comparable to light oil fuel with respect to a lift amount of the needle valve to be obtained by the DME fuel is constructed to be obtained is attained with the minimum flow path area of the fuel flow path defined by the center diameter with the needle valve at full lift, according to the total injection hole area of the fuel injection hole.

2. (currently amended) A The fuel injection nozzle for DME fuel according to claim 1, characterized in that the tip part of the needle valve has a shape that a ratio of a center diameter L3 for regulating a minimum flow path area and a seat diameter L2 of a seat part seated on the valve seat is $L3/L2 \geq 0.70$ or higher is shaped such that the size of the center diameter is made closer to that of the seat diameter by positioning the center diameter closer to the seat diameter, and such that the size of the seat diameter is made closer to that of the shaft diameter by

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positioning the seat diameter closer to the shaft diameter, to such a degree in total that an injection amount of the DME fuel which enables an engine output characteristic comparable to light oil fuel to be obtained is attained with the minimum flow path area of the fuel flow path defined by the center diameter with the needle valve at full lift, according to the total injection hole area of the fuel injection hole.

3. (currently amended) A The fuel injection nozzle for DME fuel according to claim 2, characterized in that the tip part of the needle valve has a shape that a ratio of a shaft diameter L_1 of the needle valve and the seat diameter L_2 is L_2/L_1 $[[0]]$ 0.85 or higher the center diameter to the seat diameter is 0.70 or higher, and that a ratio of a shaft the seat diameter L_1 of the needle valve and the seat diameter L_2 is L_2/L_1 $[[=]]$ to the shaft diameter is 0.85 or higher.

4. (currently amended) A The fuel injection nozzle for DME fuel according to claim 3, characterized in that the fuel injection hole has a shape that the total injection hole area is 0.6 mm² or larger.

5. (currently amended) A diesel engine comprising a fuel injection nozzle, characterized in that the fuel injection nozzle is the fuel injection nozzle for DME fuel according to claim 3 or 4 any one of claims 1 to 4,